ABSTRACT

An RTA method has a limitation on miniaturization. The RTA method needs a heating time of several seconds, and has a risk that impurities are diffused into a deep portion, since a semiconductor substrate is heated at a high temperature. Thus, the RTA method has a difficulty in responding miniaturization which is expected in the future. According to the present invention, a fundamental wave is used without putting laser light into a non-linear optical device, and laser annealing is conducted by irradiating an impurity diffusion layer with pulsed laser light having high intensity and a high repetition rate, so as to electrically activate the impurities. By the present invention, a thin layer on the surface of a silicon substrate can be partially melted to conduct activation. Further, the width of the region activated by laser-scanning once can be increased, and thus the productivity can be enhanced dramatically.